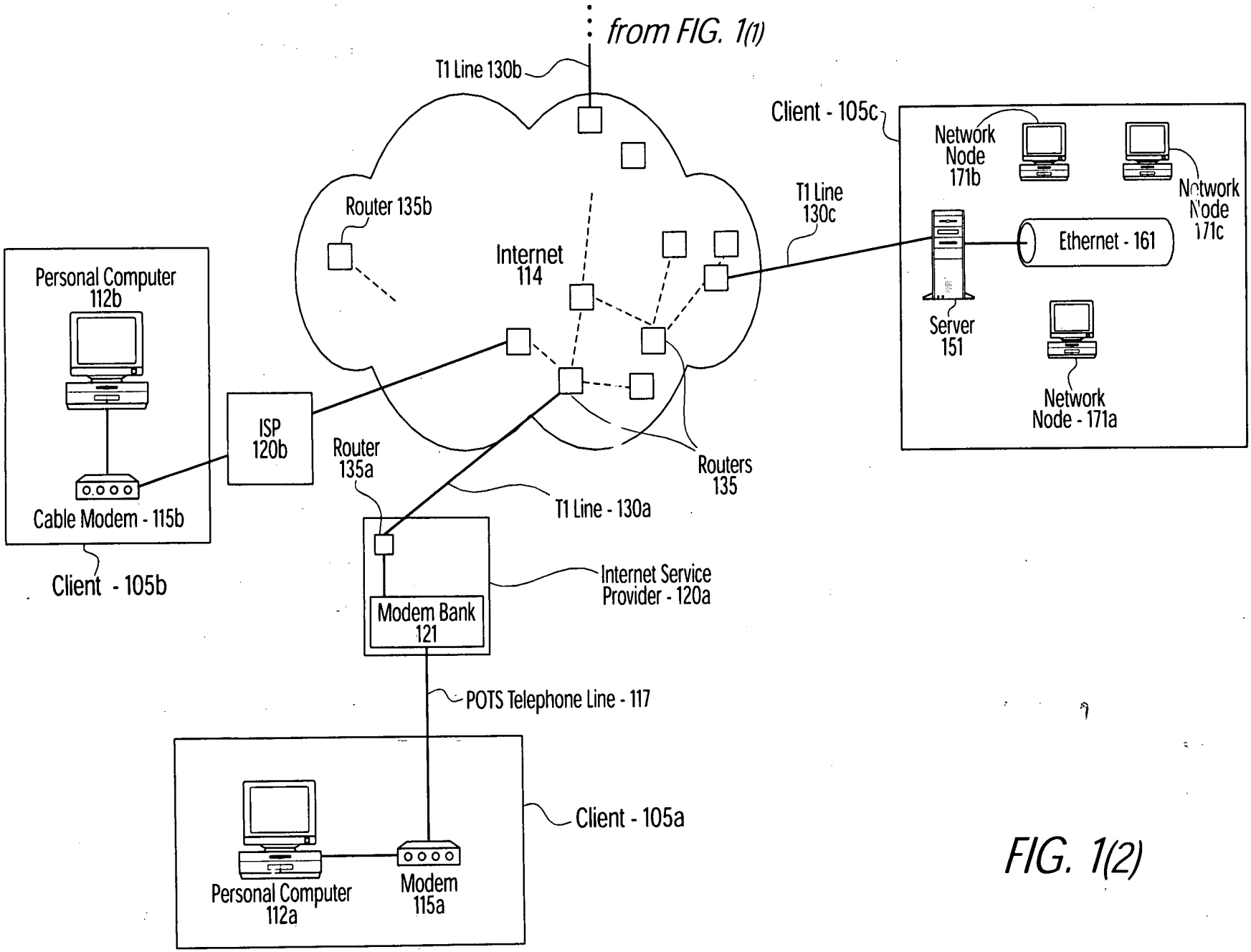
from FIG. 1(1)
T1 Line 130b
Client - 105c
Network Node 171b
Network Node 171c
T1 Line 130c
Router 135b
Internet 114
Ethernet - 161
Server 151
Network Node - 171a
Personal Computer 112b
ISP 120b
Router 135a
Routers 135
T1 Line - 130a
Cable Modem - 115b
Client - 105b
Internet Service Provider - 120a
Modem Bank 121
POTS Telephone Line - 117
Client - 105a
Personal Computer 112a
Modem 115a

FIG. 1(2)

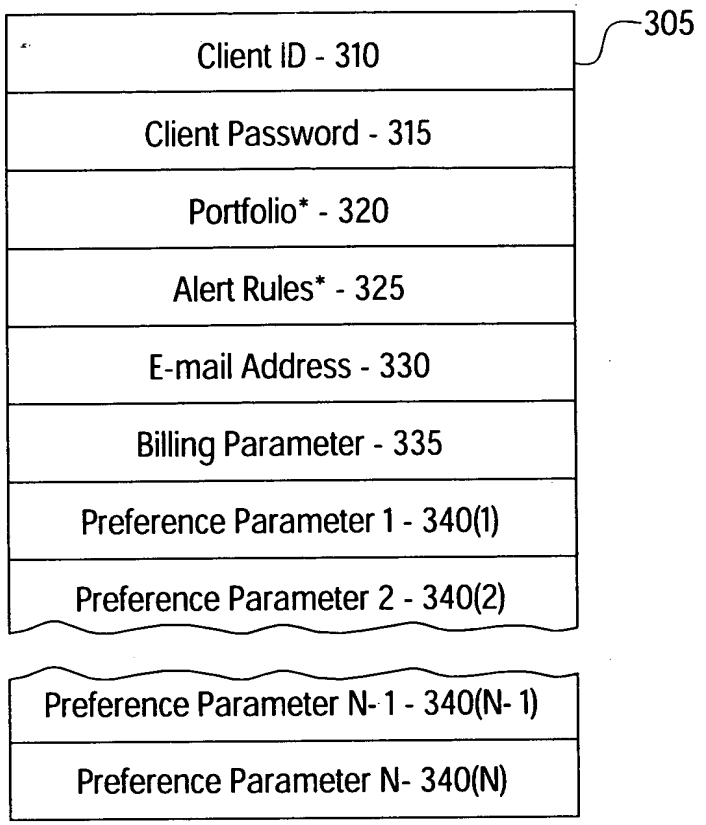
Client ID - 310
Client Password - 315
Portfolio* - 320
Alert Rules* - 325
E-mail Address - 330
Billing Parameter - 335
Preference Parameter 1 - 340(1)
Preference Parameter 2 - 340(2)
Preference Parameter N-1 - 340(N-1)
Preference Parameter N- 340(N)
305

FIG. 3

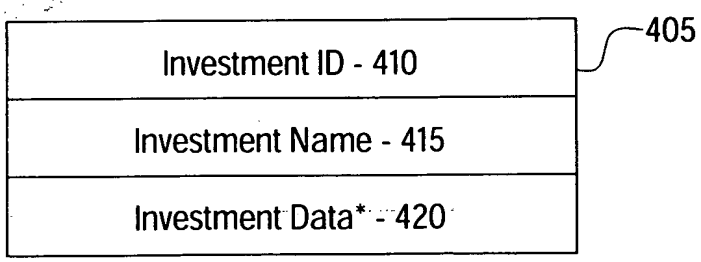
Investment ID - 410
Investment Name - 415
Investment Data* - 420
405

FIG. 4

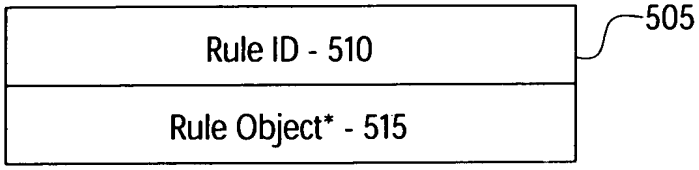
Rule ID - 510
Rule Object* - 515
505

FIG. 5a

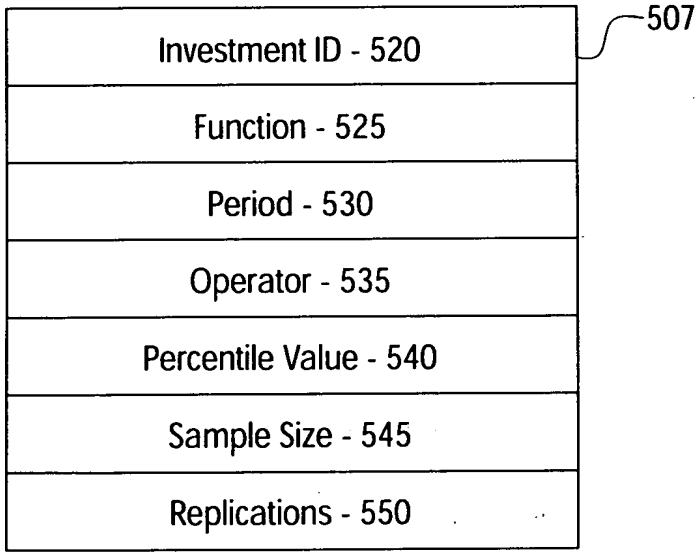
Investment ID - 520
Function - 525
Period - 530
Operator - 535
Percentile Value - 540
Sample Size - 545
Replications - 550
507

FIG. 5b

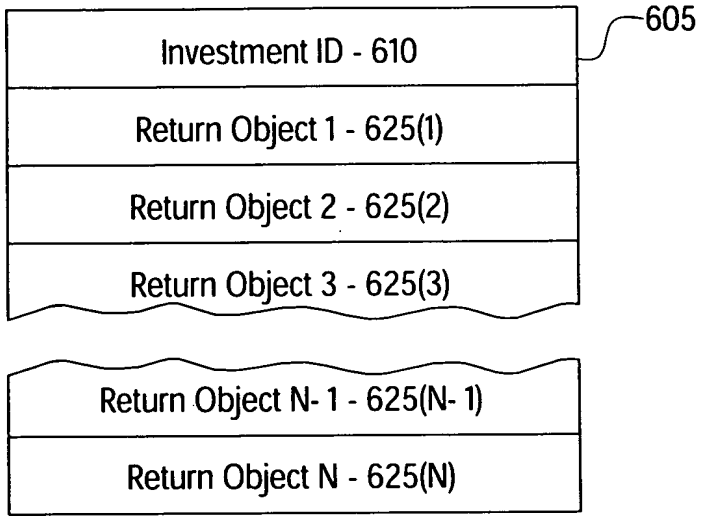
Investment ID - 610
Return Object 1 - 625(1)
Return Object 2 - 625(2)
Return Object 3 - 625(3)
Return Object N- 1 - 625(N- 1)
Return Object N - 625(N)
605

FIG. 6a

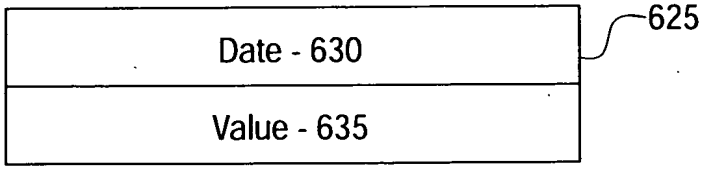
Date - 630
Value - 635
625

FIG. 6b

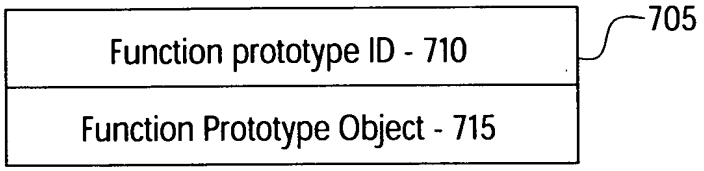
Function prototype ID - 710
Function Prototype Object - 715
705

FIG. 7

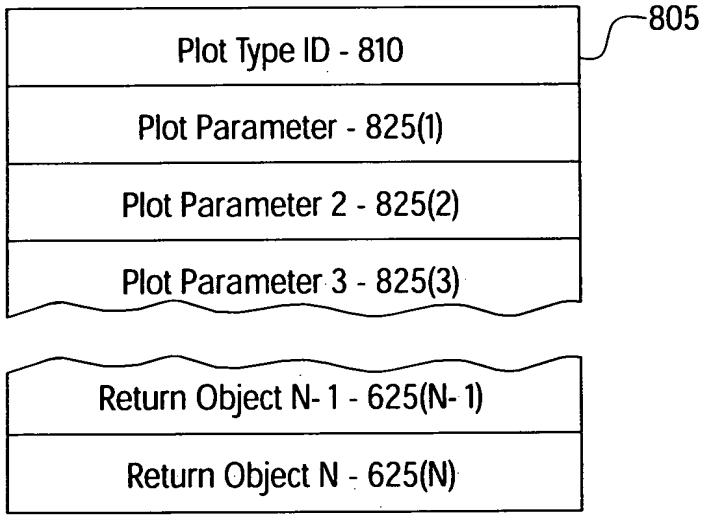
Plot Type ID - 810
Plot Parameter - 825(1)
Plot Parameter 2 - 825(2)
Plot Parameter 3 - 825(3)
Return Object N-1 - 625(N-1)
Return Object N - 625(N)
805

FIG. 8

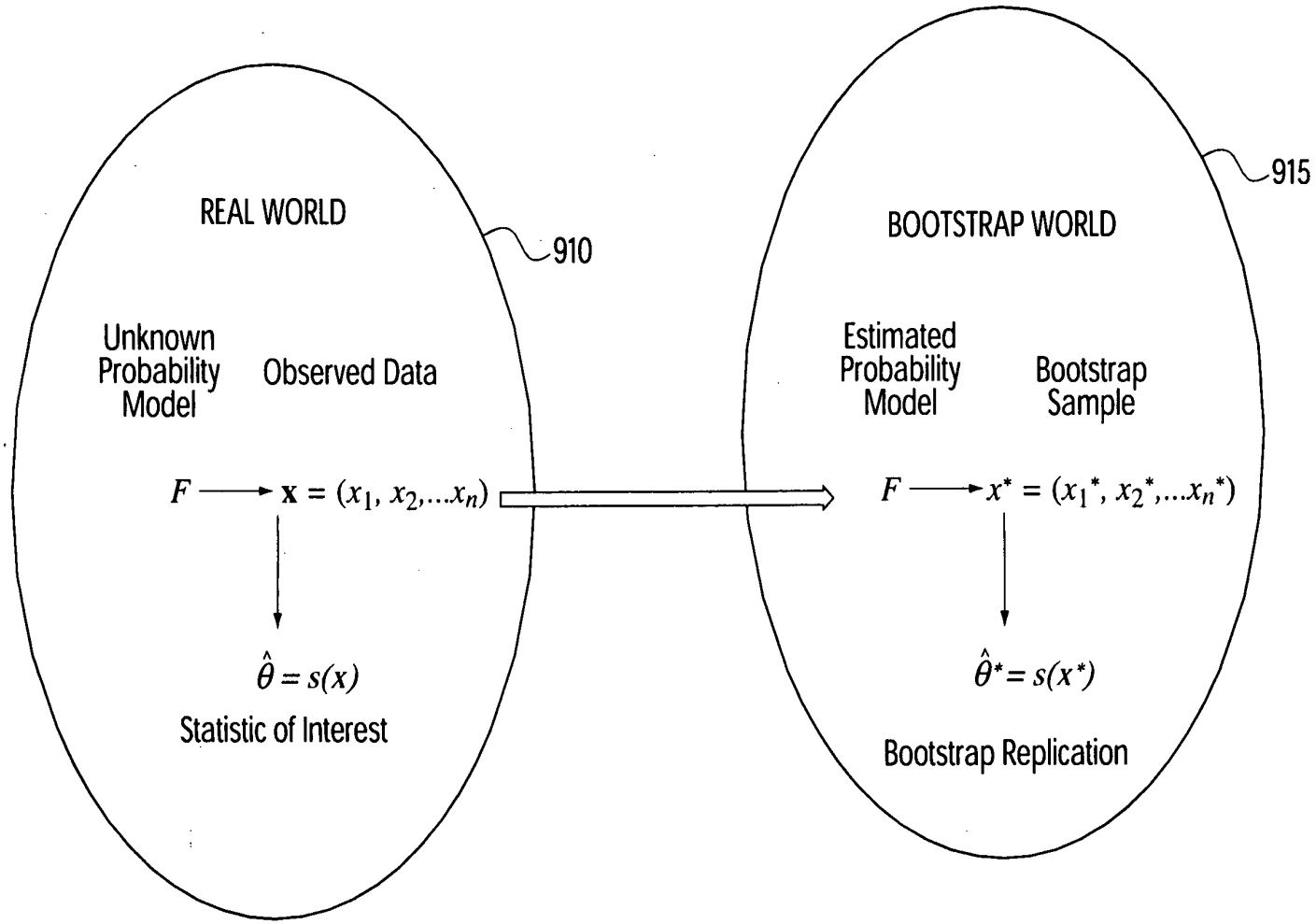
REAL WORLD
910
Unknown Probability Model
Observed Data
$F \longrightarrow \mathbf{x} = (x_1, x_2, \ldots x_n)$
$\hat{\theta} = s(x)$
Statistic of Interest
915
BOOTSTRAP WORLD
Estimated Probability Model
Bootstrap Sample
$F \longrightarrow x^* = (x_1^*, x_2^*, \ldots x_n^*)$
$\hat{\theta}^* = s(x^*)$
Bootstrap Replication

FIG. 9a

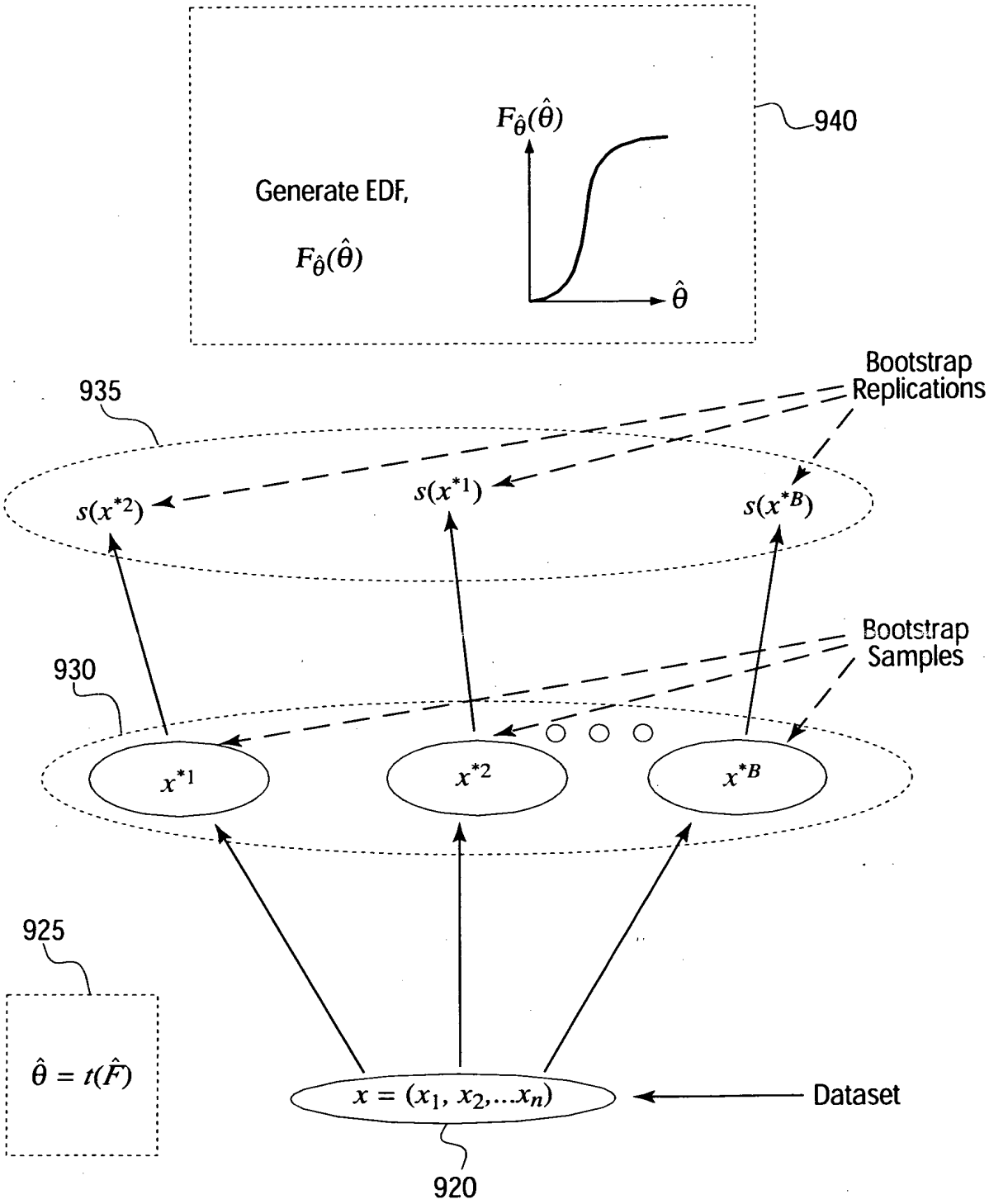
940
Generate EDF,
$F_{\hat{\theta}}(\hat{\theta})$
$F_{\hat{\theta}}(\hat{\theta})$
$\hat{\theta}$
Bootstrap Replications
935
$s(x^{*2})$
$s(x^{*1})$
$s(x^{*B})$
Bootstrap Samples
930
x^{*1}
x^{*2}
x^{*B}
925
$\hat{\theta} = t(\hat{F})$
$x = (x_1, x_2, \ldots x_n)$
Dataset
920

FIG. 9b

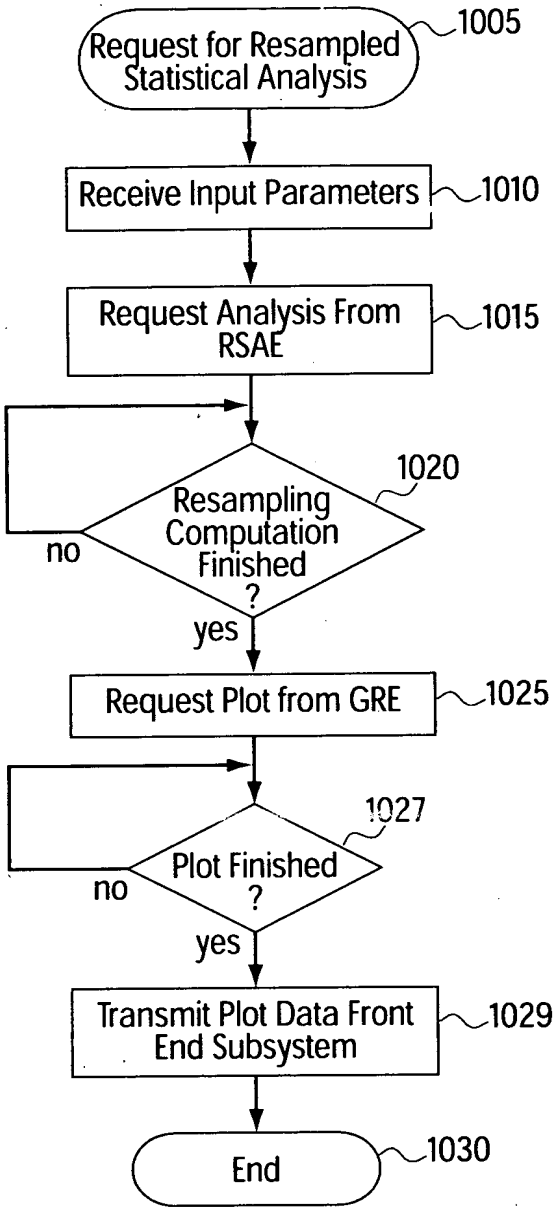
Request for Resampled Statistical Analysis
1005
Receive Input Parameters
1010
Request Analysis From RSAE
1015
Resampling Computation Finished ?
1020
no
yes
Request Plot from GRE
1025
Plot Finished ?
1027
no
yes
Transmit Plot Data Front End Subsystem
1029
End
1030

FIG. 10

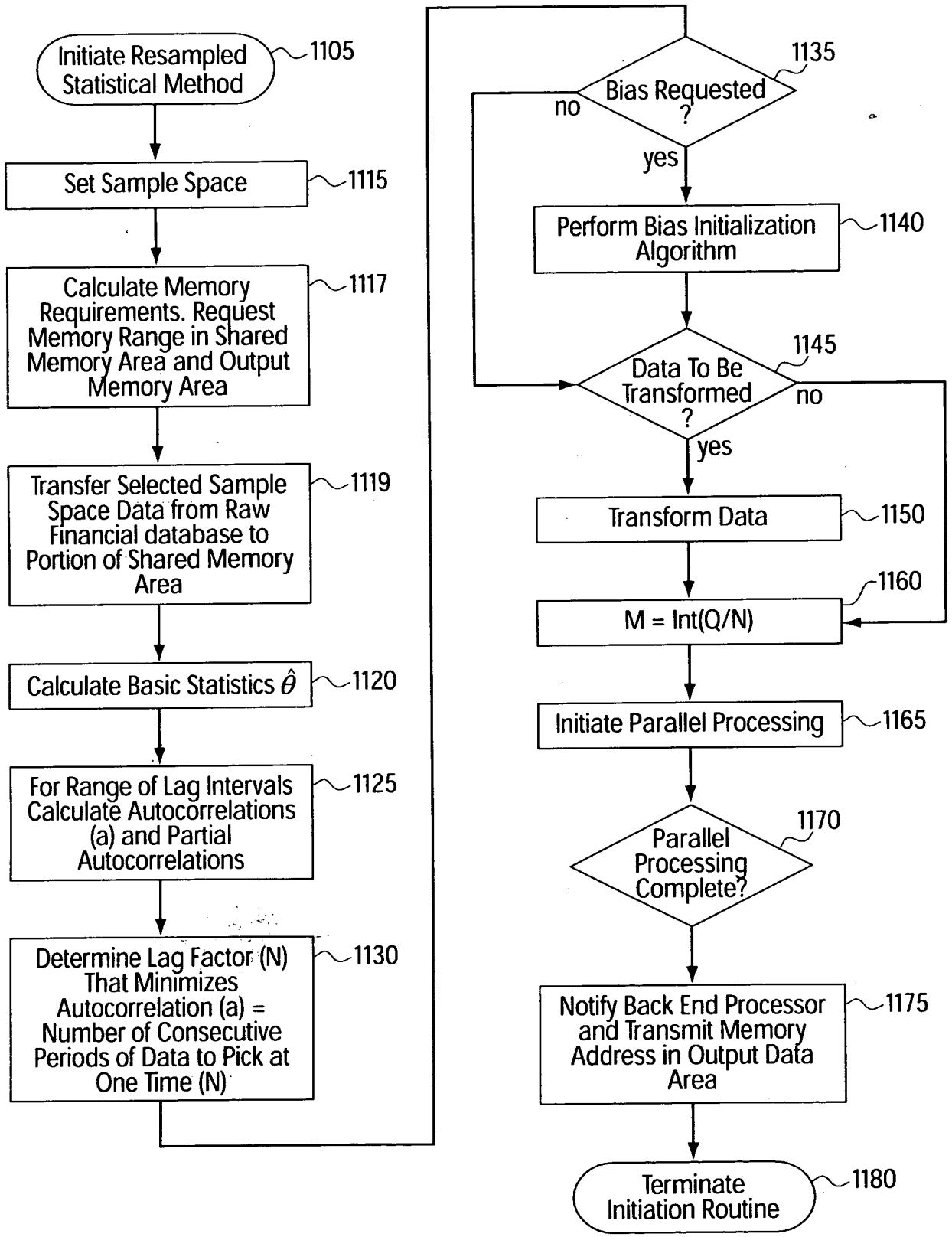
Initiate Resampled Statistical Method
1105
Set Sample Space
1115
Calculate Memory Requirements. Request Memory Range in Shared Memory Area and Output Memory Area
1117
Transfer Selected Sample Space Data from Raw Financial database to Portion of Shared Memory Area
1119
Calculate Basic Statistics $\hat{\theta}$
1120
For Range of Lag Intervals Calculate Autocorrelations (a) and Partial Autocorrelations
1125
Determine Lag Factor (N) That Minimizes Autocorrelation (a) = Number of Consecutive Periods of Data to Pick at One Time (N)
1130
Bias Requested ?
1135
no
yes
Perform Bias Initialization Algorithm
1140
Data To Be Transformed ?
1145
no
yes
Transform Data
1150
M = Int(Q/N)
1160
Initiate Parallel Processing
1165
Parallel Processing Complete?
1170
Notify Back End Processor and Transmit Memory Address in Output Data Area
1175
Terminate Initiation Routine
1180

FIG. 11

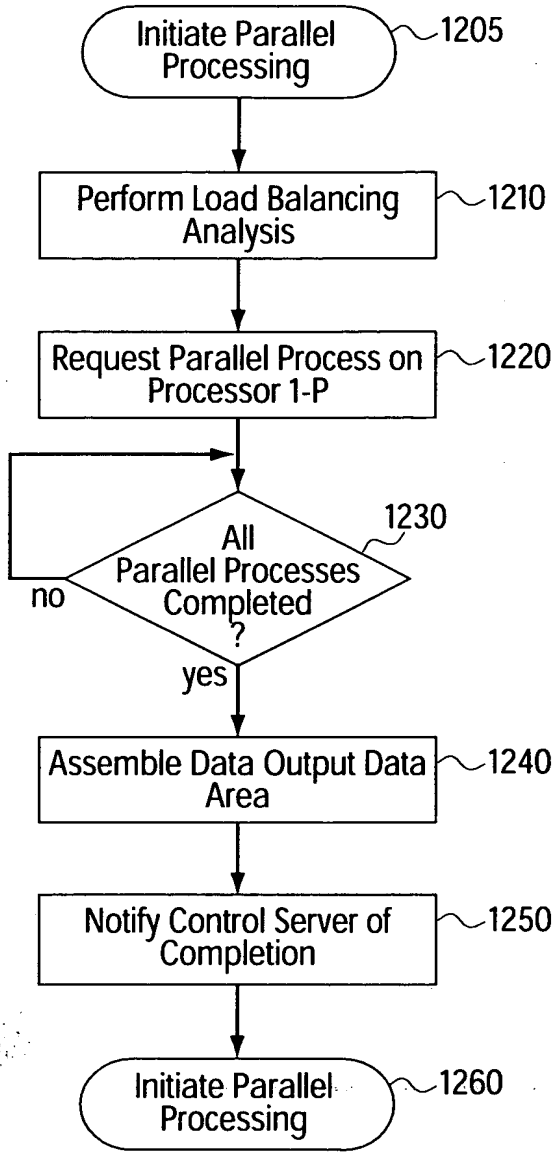
Initiate Parallel Processing
1205
Perform Load Balancing Analysis
1210
Request Parallel Process on Processor 1-P
1220
All Parallel Processes Completed ?
1230
no
yes
Assemble Data Output Data Area
1240
Notify Control Server of Completion
1250
Initiate Parallel Processing
1260

FIG. 12

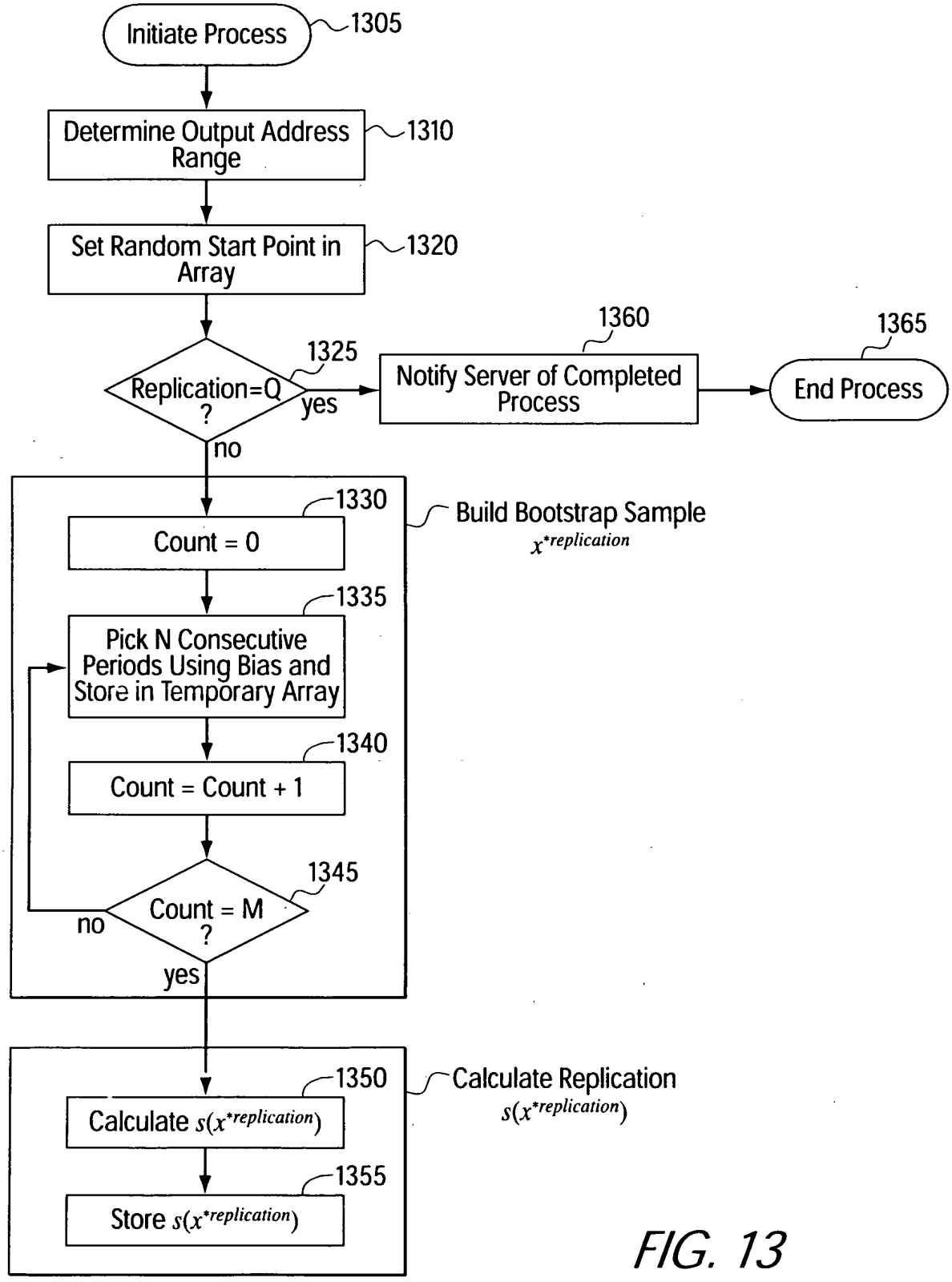
Initiate Process
1305
Determine Output Address Range
1310
Set Random Start Point in Array
1320
Replication=Q ?
1325
yes
no
1360
Notify Server of Completed Process
1365
End Process
Build Bootstrap Sample
x*replication
1330
Count = 0
1335
Pick N Consecutive Periods Using Bias and Store in Temporary Array
1340
Count = Count + 1
1345
Count = M ?
no
yes
Calculate Replication
s(x*replication)
1350
Calculate s(x*replication)
1355
Store s(x*replication)

FIG. 13

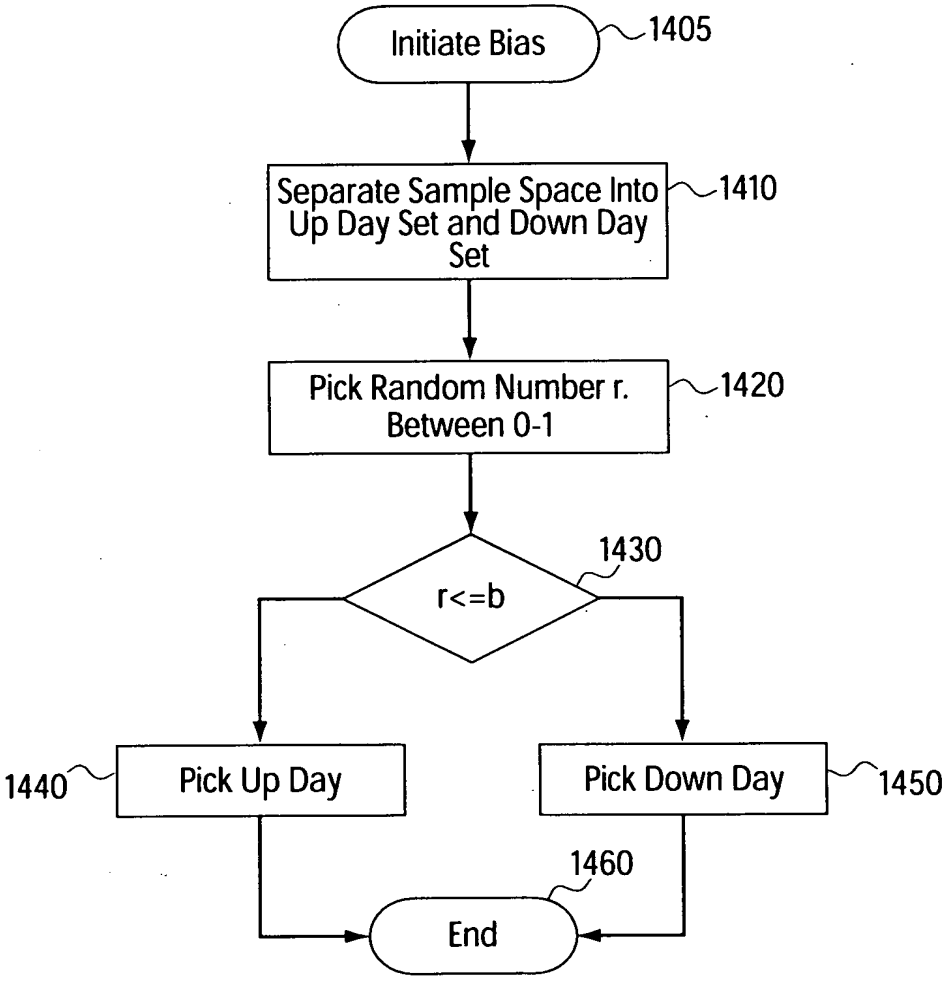
Initiate Bias
1405
Separate Sample Space Into Up Day Set and Down Day Set
1410
Pick Random Number r. Between 0-1
1420
1430
r<=b
1440
Pick Up Day
Pick Down Day
1450
1460
End

FIG. 14

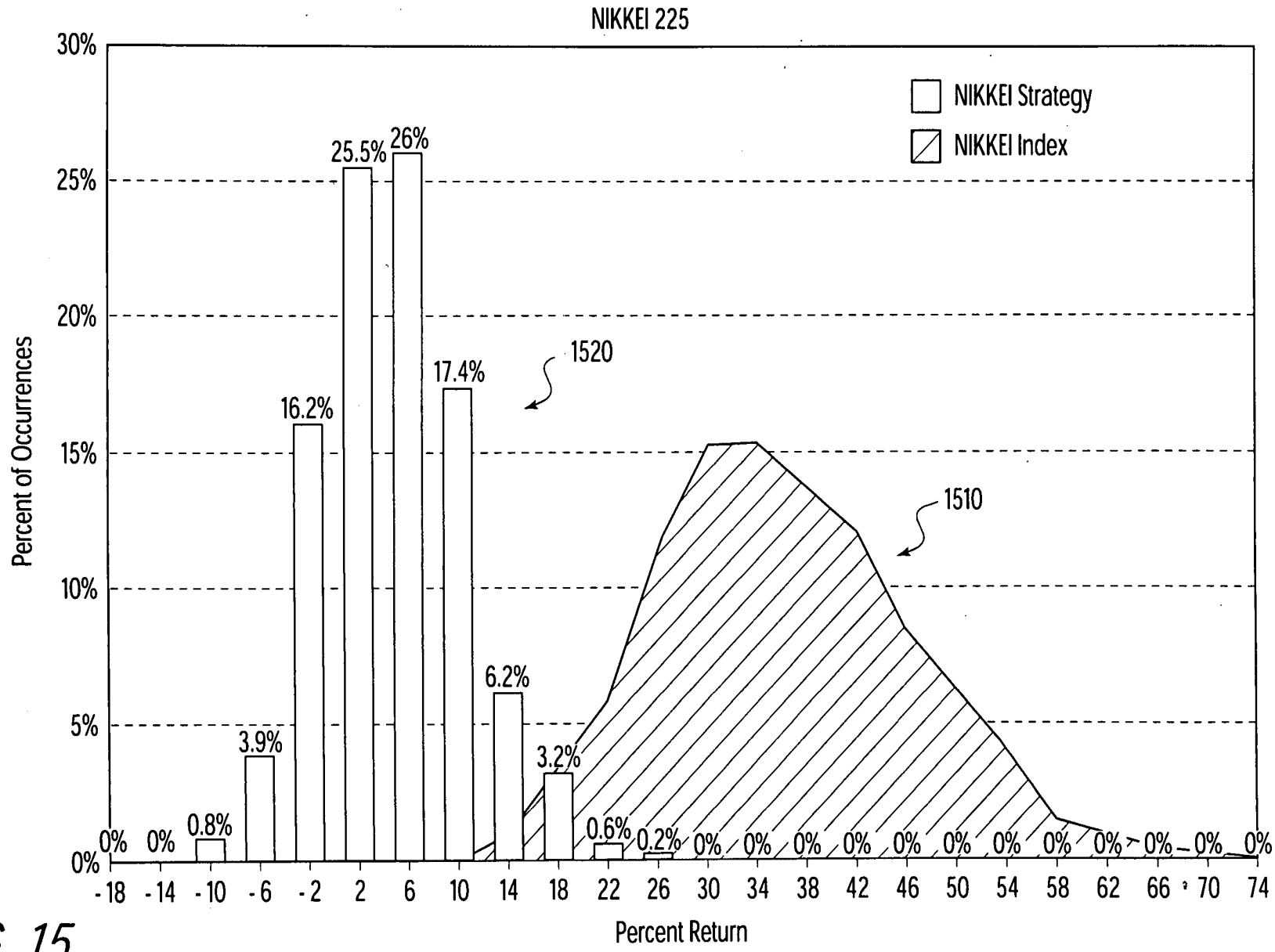
NIKKEI 225
NIKKEI Strategy
NIKKEI Index
30%
25%
20%
15%
10%
5%
0%
Percent of Occurrences
1520
1510
25.5%
26%
17.4%
16.2%
6.2%
3.9%
3.2%
0.8%
0.6%
0.2%
0%
-18 -14 -10 -6 -2 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70 74
Percent Return

FIG. 15

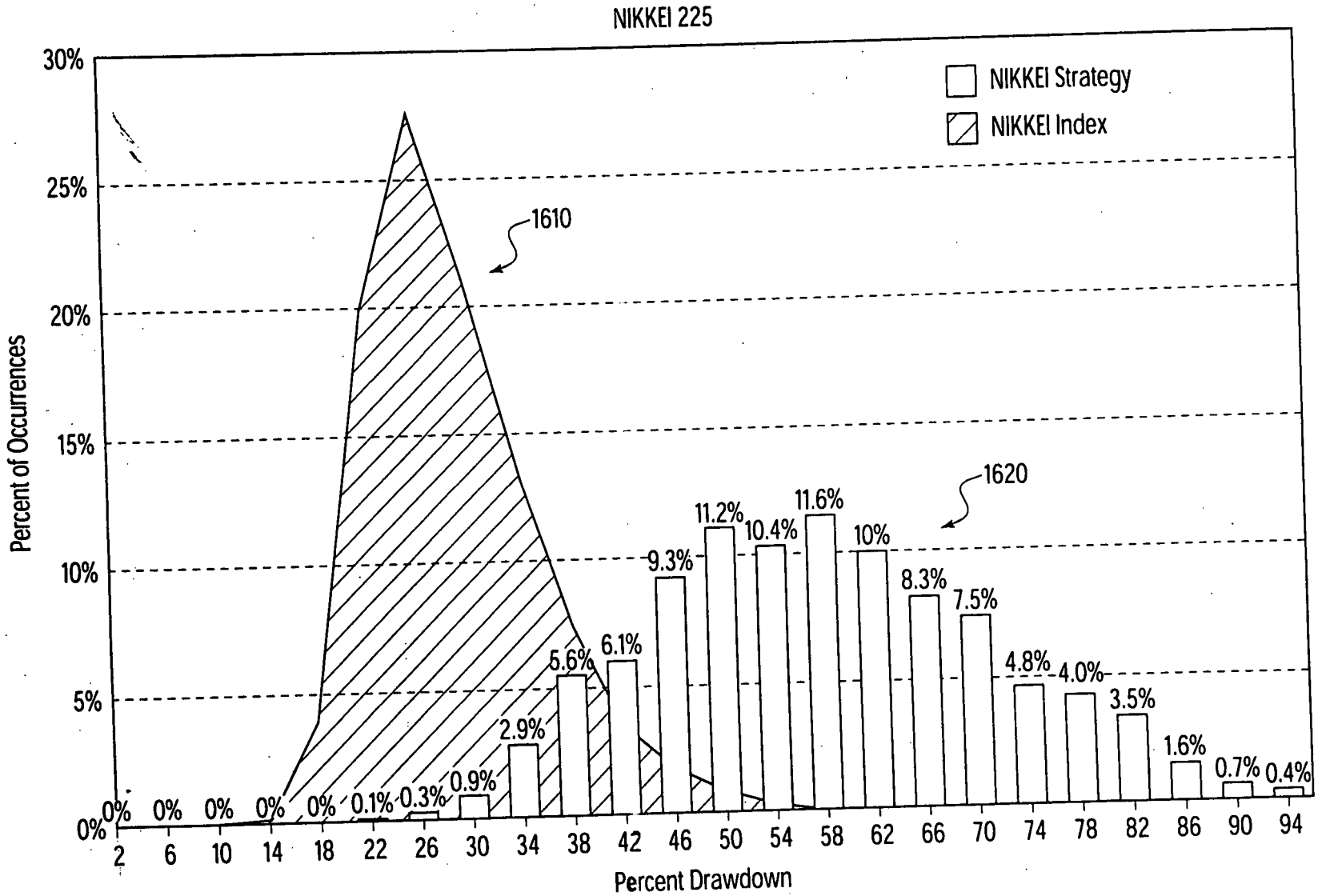
NIKKEI 225
NIKKEI Strategy
NIKKEI Index
1610
1620
Percent of Occurrences
30%
25%
20%
15%
10%
5%
0%
0% 0% 0% 0% 0% 0.1% 0.3% 0.9% 2.9% 5.6% 6.1% 9.3% 11.2% 10.4% 11.6% 10% 8.3% 7.5% 4.8% 4.0% 3.5% 1.6% 0.7% 0.4%
2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70 74 78 82 86 90 94
Percent Drawdown

FIG. 16

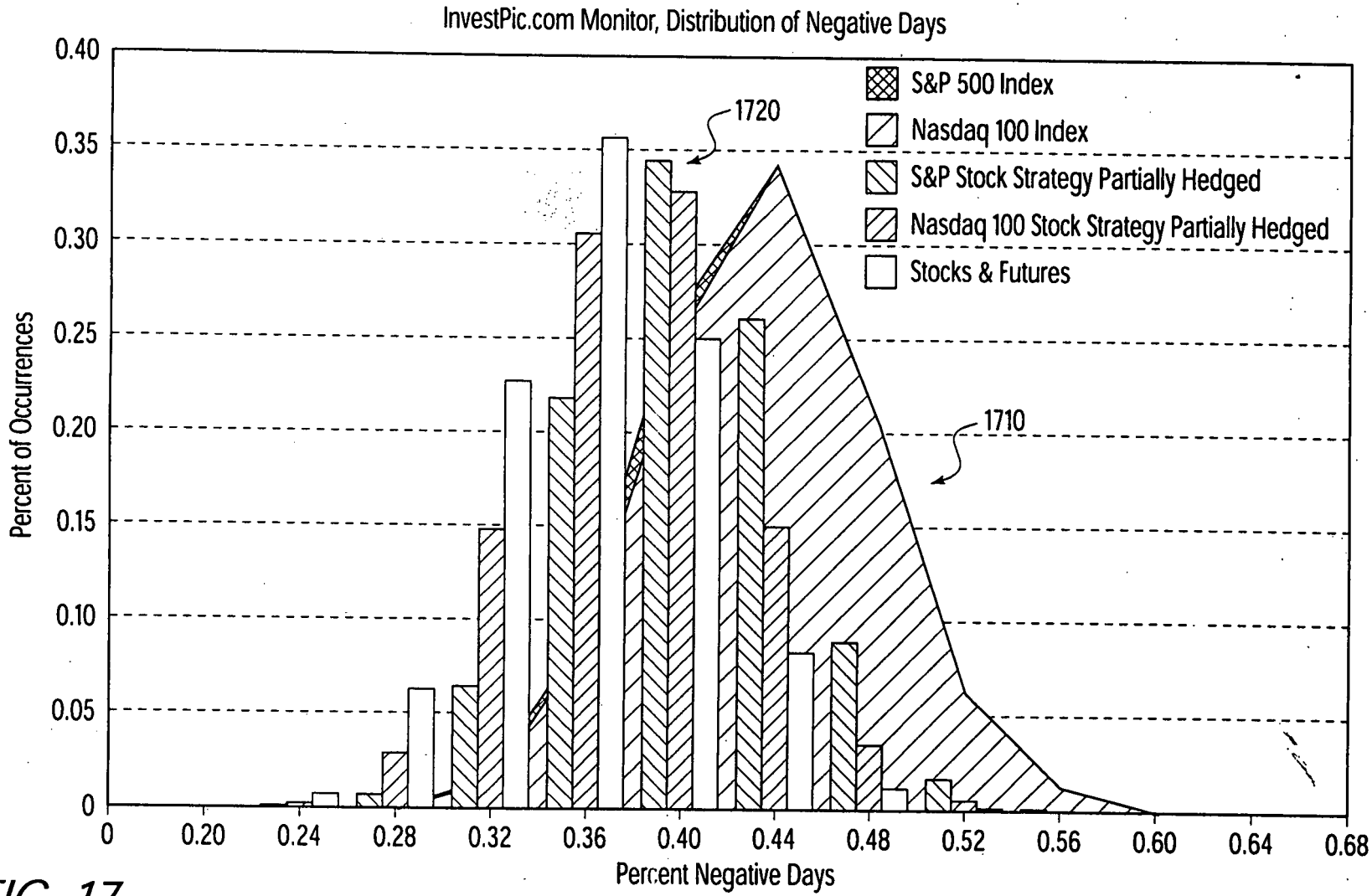
InvestPic.com Monitor, Distribution of Negative Days
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
Percent of Occurrences
0
0.20
0.24
0.28
0.32
0.36
0.40
0.44
0.48
0.52
0.56
0.60
0.64
0.68
Percent Negative Days
S&P 500 Index
Nasdaq 100 Index
S&P Stock Strategy Partially Hedged
Nasdaq 100 Stock Strategy Partially Hedged
Stocks & Futures
1720
1710

FIG. 17